

CLAIMS

1. A picture conversion apparatus that converts an inputted interlaced video signal into a progressive video
5 signal, comprising:

an interpolation circuit that generates interpolated pixels between lines on the basis of said inputted interlaced video signal;

10 a motion calculation circuit that calculates a motion amount in the vertical direction of a picture on the basis of said interpolation signal outputted from said interpolation circuit;

15 a still picture processing circuit that generates a still picture progressive signal by still picture processing from said inputted interlaced video signal;

a moving picture processing circuit that generates a moving picture progressive signal by moving picture processing from said inputted interlaced video signal; and

20 an output circuit that outputs the still picture progressive signal outputted from said still picture processing circuit as said progressive video signal when said motion amount calculated by said motion calculation circuit is smaller than a first value.

25 2. The picture conversion apparatus according to claim

1, wherein

 said interpolation circuit includes
 an interlace generation circuit that generates a
 plurality of interlaced video signals respectively
5 corresponding to a plurality of successive fields on the basis
 of said inputted interlaced video signal,

 a progressive generation circuit that generates a
 progressive signal on the basis of the plurality of interlaced
 video signals generated by said interlace generation circuit,

10 and

 a pixel generation circuit that generates interpolated
 pixels between lines by interpolation processing using said
 progressive signal generated by said progressive generation
 circuit, and outputs an interpolation signal including pixels
15 in said progressive signal and the interpolated pixels, and

 said motion calculation circuit calculates said motion
 amount on the basis of said interpolation signal outputted
 from said pixel generation circuit.

20 3. The picture conversion apparatus according to claim
2, wherein said first value is a value which is not more than
the spacing between lines.

25 4. The picture conversion apparatus according to claim
2, wherein said motion calculation circuit calculates the

motion amount in the vertical direction on the basis of a value smaller than the spacing between lines.

5. The picture conversion apparatus according to claim
5 2, wherein

10 said progressive generation circuit comprises
a first progressive generation circuit that generates
a first progressive signal on the basis of a first combination
of more than one of the plurality of interlaced video signals
generated by said interlace generation circuit, and

15 a second progressive generation circuit that generates
a second progressive signal on the basis of a second
combination, which differs from said first combination, of
more than one of the plurality of interlaced video signals
generated by said interlace generation circuit,

20 said pixel generation circuit comprises
a first pixel generation circuit that generates
interpolated pixels between lines by interpolation
processing using said first progressive signal generated by
said first progressive generation circuit to output a first
interpolation signal including the pixels in said first
progressive signal and the interpolated pixels, and

25 a second pixel generation circuit that generates
interpolated pixels between lines by interpolation
processing using said second progressive signal generated by

said second progressive generation circuit to output a second interpolation signal including the pixels in said second progressive signal and the interpolated pixels, and

5 said motion calculation circuit calculates said motion amount on the basis of said first interpolation signal outputted from said first pixel generation circuit and said second interpolation signal outputted from said second pixel generation circuit.

10 6. The picture conversion apparatus according to claim 2, wherein said output circuit outputs said moving picture progressive signal as said progressive video signal when said motion amount is larger than a second value.

15 7. The picture conversion apparatus according to claim 6, wherein said output circuit synthesizes, when said motion amount is between said first value and said second value, said moving picture progressive signal and said still picture progressive signal at a ratio based on said motion amount to 20 output the synthesized signal as said progressive video signal.

25 8. The picture conversion apparatus according to claim 2, wherein said output circuit sets the ratio of said still picture progressive signal to not less than 0.5 when said

motion amount is not more than the spacing between lines.

9. The picture conversion apparatus according to claim
2, wherein

5 said output circuit sets the ratio of said still picture
progressive signal to not less than 0.5 when said motion
amount is not more than 0.75 times the spacing between lines.

10 10. The picture conversion apparatus according to claim
2, wherein

 said output circuit sets the ratio of said still picture
progressive signal to not less than 0.5 when said motion
amount is not more than 0.5 times the spacing between lines.

15 11. The picture conversion apparatus according to claim
5, wherein

 said plurality of interlaced video signals include
first to fourth interlaced video signals corresponding to
successive first to fourth fields,

20 said first combination of more than one of the plurality
of interlaced video signals include said first to third
interlaced video signals, and

 said second combination of more than one of the
plurality of interlaced video signals include said second to
25 fourth interlaced video signals.

12. The picture conversion apparatus according to claim
2, further comprising

a judgment circuit that respectively calculates the
5 averages of the values of object pixels and pixels peripheral
thereto in the plurality of interlaced video signals
corresponding to the plurality of fields, and judges whether
said still picture progressive signal is adaptive or
non-adaptive on the basis of said calculated averages,
10 said output circuit outputting the moving picture
progressive signal as said progressive video signal when the
result of the judgment by said judgment circuit is
non-adaptive.

15 13. The picture conversion apparatus according to claim
12, wherein

said judgment circuit respectively calculates the
maximums and the minimums of the values of the object pixels
and the pixels peripheral thereto in the plurality of
20 interlaced video signals corresponding to said plurality of
fields to judge whether said still picture progressive signal
is adaptive or non-adaptive on the basis of said calculated
averages, maximums, and minimums.

25 14. The picture conversion apparatus according to claim

12, wherein

 said judgment circuit judges whether said still picture progressive signal to be non-adaptive when the respective differences between the calculated averages are larger than
5 a predetermined value, and the difference between the maximum and the minimum in the same field is smaller than the predetermined value.

15. A picture conversion method in which an inputted
10 interlaced video signal is converted into a progressive video signal, comprising the steps of:

 generating interpolated pixels between lines, and outputting an interpolation signal including the interpolated pixels;

15 calculating a motion amount in the vertical direction of a picture on the basis of the outputted interpolation signal;

 generating a still picture progressive signal by still picture processing from said inputted interlaced video
20 signal;

 generating a moving picture progressive signal by moving picture processing from said inputted interlaced video signal; and

 outputting said outputted still picture progressive
25 signal as said progressive video signal when said calculated

motion amount is smaller than a first value.

16. The picture conversion method according to claim
15, wherein

5 said step of generating interpolated pixels includes
the steps of

generating a plurality of interlaced video signals
respectively corresponding to a plurality of successive
fields on the basis of said inputted interlaced video signal,

10 generating a progressive signal on the basis of the
generated plurality of interlaced video signals, and

generating interpolated pixels between lines by
interpolation processing using said generated progressive
signal, and outputting an interpolation signal including
15 pixels in said progressive signal and the interpolated
pixels, and

 said step of calculating a motion amount includes the
step of

 calculating said motion amount on the basis of the
20 outputted interpolation signal.